ENERGY TRANSITION WEEKLY - GLOBAL EDITION

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A weekly intelligence briefing for North East Scotland energy supply chain companies covering offshore wind, hydrogen, CCUS, decommissioning and other renewables developments impacting the global energy transition and the supply chains that support it.

EXECUTIVE SUMMARY

The past seven days have underscored a critical inflection point for global offshore wind: Europe's largest market continues to consolidate supply chain infrastructure with major offshore substations reaching installation readiness, Asia's turbine technology pushes toward 20 MW commercial deployment, and the United States remains mired in legal and political uncertainty as the Trump administration appeals court rulings that reinstated halted East Coast projects. Meanwhile, Europe's hydrogen sector advanced with €105 million in 2026 funding calls opening from the Clean Hydrogen Partnership and Finland signing a landmark letter of intent for a 200 MW e-fuel plant in the Baltic region.

One key number: 20 MW – China Three Gorges successfully grid-connected the world's first 20 MW offshore wind turbine on 6 February 2026, marking a new global benchmark for turbine capacity and signaling continued Chinese technological leadership in the offshore wind sector.

Action for this week: North East Scotland supply chain companies should monitor German offshore substation delivery timelines (Nordseecluster A reaching installation phase) as indicators of European offshore wind construction momentum, while assessing opportunities in the Clean Hydrogen Partnership's €105 million funding call – particularly the €25 million allocated to Hydrogen Valleys topics which favour integrated offshore wind-hydrogen projects.

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1. GLOBAL OFFSHORE WIND DEVELOPMENTS

1.1 Europe: Nordseecluster A Substations Ready for North Sea Installation

RWE and Norges Bank Investment Management announced on 12 February 2026 that two offshore substations for the Nordseecluster A offshore wind farm have been completed and are ready for installation in the German North Sea. The substations, manufactured at facilities in Saint-Nazaire, France, represent a critical milestone for the large-scale project which is scheduled to commence operations in early 2027.

Nordseecluster A forms part of Germany's ambitious North Sea offshore wind buildout targeting 30 GW by 2030 and up to 70 GW by 2045. The project will connect to the German transmission grid via high-voltage direct current (HVDC) offshore cables, feeding renewable electricity into the industrial heartlands of North Rhine-Westphalia and Lower Saxony.

For North East Scotland supply chain companies, this development signals sustained demand for offshore substation components, HVDC equipment, heavy-lift installation vessels, and commissioning services throughout 2026-2027. The successful delivery of complex offshore electrical infrastructure under challenging North Sea conditions demonstrates that European supply chains are maturing toward serial delivery rather than one-off projects.

Separately, Amazon signed a Power Purchase Agreement on 3 February for electricity from RWE's Nordseecluster B offshore wind farm, further demonstrating corporate appetite for long-term renewable power contracts that de-risk project finance and provide revenue certainty to developers.

1.2 China: World's First 20 MW Offshore Wind Turbine Grid-Connected

China Three Gorges achieved a global first on 6 February 2026 with the successful grid connection of a 20 MW offshore wind turbine installed off China's coast. The milestone represents a significant leap from the current commercial standard of 15-16 MW units deployed in European and Asian waters, and underscores China's continued push toward larger, more powerful turbine platforms.

The 20 MW unit features a rotor diameter exceeding 260 meters and swept area of approximately 53,000 square meters – equivalent to more than seven football pitches. At rated capacity, a single turbine can generate sufficient electricity to power approximately 40,000 Chinese households annually, significantly improving the economics of offshore wind generation in deeper waters and higher wind resource sites.

Technology implications:

The progression to 20 MW platforms creates cascading supply chain requirements including larger nacelles, longer blades requiring advanced composite materials, more powerful generators and power electronics, and installation vessels with significantly higher lifting capacities. For European supply chain companies, this Chinese technology advancement sets a competitive benchmark that will influence next-generation European turbine specifications and supply chain investment decisions through 2026-2030.

Industry observers note that while China is pushing turbine capacity boundaries, European and North American developers remain focused on optimizing reliability, availability and lifetime costs of 15-18 MW platforms before pursuing larger units. This divergence reflects different market priorities: China emphasizes rapid deployment and technology leadership, while Western markets prioritize proven performance and bankability.

1.3 United States: Legal Battles Continue Over Offshore Wind Suspensions

The Trump administration's decision to appeal federal court rulings that lifted stop-work orders on major East Coast offshore wind projects dominated US renewable energy news during the week ending 13 February. The administration's Department of Justice filed appeals on 11 February seeking to reinstate construction halts on five projects representing approximately 5.8 GW of capacity: Coastal Virginia Offshore Wind, Vineyard Wind 1, Revolution Wind, Sunrise Wind and Empire Wind 1.

Current status:

- **Coastal Virginia Offshore Wind (2.6 GW):** Construction resumed in mid-January following court order lifting suspension. Dominion Energy reports the project was incurring losses of approximately $5 million per day during the halt and remains on track for 2026 commissioning of initial turbines.

- **Vineyard Wind 1 (800 MW):** Approximately 30 turbines operational and generating electricity; construction of remaining turbines remains suspended pending legal resolution.

- **Revolution Wind, Sunrise Wind, Empire Wind 1:** All remain under stop-work orders with developers (Ørsted, Equinor) continuing legal challenges arguing "immediate, irreparable harm" to projects that were fully permitted and under construction.

Democratic governors in Massachusetts, New York, Rhode Island, Connecticut and Virginia have committed to defending offshore wind projects through state-level legal interventions and policy support. However, the extended uncertainty is creating significant financial strain on developers and threatening the viability of projects that depend on narrow construction weather windows and tightly coordinated international supply chains.

For international supply chain companies with contractual exposure to US offshore wind, the situation underscores the importance of robust force majeure provisions, payment security mechanisms and geographic diversification. The US market presents significant opportunity but elevated regulatory and political risk compared to European and Asian markets.

1.4 East Coast Cold Snap Demonstrates Offshore Wind Reliability

Amid the political turbulence, US offshore wind projects demonstrated strong performance during a severe cold weather event that affected the Eastern Seaboard during the week ending 13 February. Operating offshore wind turbines maintained high availability and capacity factors during the extreme cold, providing critical electricity supply when onshore natural gas infrastructure faced supply constraints and heating demand surged.

The performance data provides important evidence for offshore wind's reliability credentials and grid contribution during peak demand periods – a key consideration for grid operators and policymakers evaluating the technology's role in future power systems. Industry advocates are using the data to counter arguments from offshore wind opponents who claim the technology is unreliable or unsuitable for baseload power provision.

1.5 Netherlands Confirms 40 GW Offshore Wind Target

The new Dutch government confirmed on 3 February its commitment to deploying 40 GW of offshore wind capacity in Dutch waters by 2040, maintaining the trajectory established by the previous administration. The confirmation provides long-term policy certainty for developers, supply chain companies and financial institutions investing in Netherlands offshore wind infrastructure.

The 40 GW target positions the Netherlands as one of Europe's largest offshore wind markets alongside the UK (50 GW target by 2030) and Germany (70 GW by 2045). The Dutch offshore wind sector benefits from strong existing oil and gas infrastructure in the North Sea, world-class port facilities in Rotterdam and IJmuiden, and deep engineering expertise in offshore construction and marine logistics.

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2. HYDROGEN INFRASTRUCTURE AND CROSS-BORDER INTEGRATION

2.1 EU Clean Hydrogen Partnership Opens €105 Million Funding Call

The Clean Hydrogen Partnership announced on 9 February 2026 the opening of its 2026 Call for Proposals with an indicative total budget of €105 million supporting cutting-edge hydrogen technology development across Europe. The call encompasses 21 topics grouped across six thematic areas:

- **Renewable Hydrogen Production:** 6 topics, €16 million funding

- **Hydrogen Storage and Distribution:** 4 topics, €17.5 million funding
- **Transport:** 4 topics, €25 million funding
- **Heat and Power:** 3 topics, €16 million funding
- **Cross-cutting:** 2 topics, €5.5 million funding
- **Hydrogen Valleys:** 2 topics, €25 million funding

The Hydrogen Valleys allocation represents a strategic priority, supporting integrated regional hydrogen ecosystems that combine production (often linked to renewable generation including offshore wind), storage, distribution infrastructure and multiple end-use applications. This integrated approach addresses one of hydrogen's fundamental challenges: the "chicken-and-egg" problem where production infrastructure requires demand certainty while demand requires supply certainty.

For North East Scotland companies, the Hydrogen Valleys topics offer opportunity to leverage Scottish Cluster (Acorn) experience and offshore wind integration expertise into European collaborative projects. Successful applications typically demonstrate:

- Clear pathways to commercial viability beyond subsidy support
- Integration with existing or planned renewable energy generation (offshore wind, solar)
- Multiple industrial offtakers providing demand certainty
- Involvement of technology providers, utilities, industrial users and regional authorities
- Transferable learnings applicable to other European regions

2.2 Finland: Hy2gen Advances 200 MW E-Fuel Plant in Oulu

German hydrogen developer Hy2gen signed a letter of intent on 12 February 2026 with the City of Oulu, Finland, to develop a 200 MW hydrogen-based e-fuel plant positioned to become the largest synthetic fuel production hub in the Baltic Sea region. The facility will be located on the green transition industrial area in Vihreäsaari, with Hy2gen having secured land rights in November 2025.

The project represents growing momentum in power-to-X (PtX) technologies that convert renewable electricity and captured CO_2 into synthetic liquid fuels compatible with existing transport infrastructure and internal combustion engines.

E-fuels offer a decarbonization pathway for aviation, maritime shipping and heavy-duty road transport – sectors where direct electrification faces technical and economic challenges.

Technology pathway:

The Oulu facility will use renewable electricity (likely from Finnish wind and hydropower) to produce hydrogen via electrolysis, then combine the hydrogen with captured CO_2 to synthesize liquid fuels through Fischer-Tropsch or methanol-to-gasoline processes. The final products – synthetic kerosene, diesel or gasoline – are chemically identical to fossil-derived fuels and require no modifications to existing engines, fuel distribution infrastructure or refueling stations.

Finland's strategic positioning for e-fuel production reflects several advantages: abundant low-cost renewable electricity from wind and hydropower, access to industrial CO_2 sources (pulp and paper, district heating), proximity to Baltic shipping lanes and Scandinavian aviation hubs, and strong government support for green industrial transformation.

For supply chain companies, the emerging e-fuels sector creates demand for large-scale electrolyzers, CO_2 capture and purification equipment, synthesis reactors, product storage tanks and specialized handling systems for hydrogen and synthetic fuels.

2.3 Germany Invests €54 Million in Bavarian Hydrogen Mobility Hub

Germany announced on 13 February 2026 a €54 million investment in a new hydrogen mobility research hub in Bavaria, focused on accelerating heavy-duty vehicle deployment and refueling infrastructure. The facility will serve as a testing and demonstration center for hydrogen fuel cell trucks, buses and hydrogen internal combustion engine (H2-ICE) vehicles, addressing one of the critical barriers to hydrogen mobility scale-up: the lack of real-world operational data and standardized performance metrics.

The Bavarian hub complements Germany's broader €7 billion hydrogen funding program announced for 2026, which includes carbon contracts for difference (CCfDs) for industrial hydrogen production, pipeline infrastructure investment and electrolyzer manufacturing support. Germany's sustained investment in hydrogen infrastructure reflects strategic recognition that industrial decarbonization, particularly in chemicals, steel and heavy transport, requires hydrogen as an energy vector alongside direct electrification.

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3. CARBON CAPTURE, UTILIZATION AND STORAGE (CCUS)

3.1 Global CCUS Sector Enters Critical Deployment Phase

Industry analysis published during the week ending 13 February identified 2026 as a defining year for global CCUS deployment, with multiple first-of-a-kind commercial-scale projects reaching final investment decision (FID) or commencing operations.

The report highlighted that approximately 350 CCUS facilities are now operational, under construction or in advanced development globally – representing a significant expansion from fewer than 30 operating facilities in 2020.

Regional developments:

- **North America:** United States leading deployment with concentration in Texas Gulf Coast (petrochemicals, refining, power generation) and Upper Midwest (bioenergy with CCS). Wyoming and North Dakota host legacy large-scale capture projects (LaBarge, Great Plains Synfuels). Stratos direct air capture (DAC) facility in Texas expected to commence operations in 2026 as world's largest DAC installation.

- **Europe:** Denmark's Project Greensand advancing toward operations providing offshore CO_2 storage in depleted North Sea fields. Norway's Northern Lights project (part of Longship initiative) progressing with dedicated CO_2 shipping infrastructure. UK Track-1 clusters (HyNet, East Coast Cluster) and Scottish Cluster (Acorn) advancing through development phases.

- **Asia-Pacific:** Growing interest in ASEAN region following Asian Development Bank policy shift enabling CCUS in depleted oil and gas fields. Malaysia, Indonesia and Brunei progressing feasibility studies for offshore CO_2 storage projects.

Technology cost trends:

Advanced solvent formulations with lower regeneration energy requirements, process integration to reduce parasitic loads, and modular capture units are driving CCUS costs down. However, CO_2 transport and storage infrastructure remains a critical enabler and potential bottleneck – particularly in regions without existing oil and gas pipeline networks or depleted reservoir access.

For North East Scotland companies with offshore engineering, subsea infrastructure and reservoir management expertise, the global CCUS buildout creates sustained demand for platform conversion engineering, CO_2 injection well design, subsea pipeline installation, monitoring and verification systems, and offshore operations and maintenance services.

4. FLOATING OFFSHORE WIND: TECHNOLOGY AND COMMERCIAL PROGRESS

4.1 Five Gigascale Floating Wind Projects Set to Shape Sector

Industry analysis published on 3 February identified five gigawatt-scale floating wind projects positioned to define the technology's commercial trajectory through 2030.

The projects – spanning UK, South Korea, Norway, Spain and Portugal – collectively represent over 15 GW of floating capacity and will establish cost benchmarks, supply chain requirements and operational best practices for the emerging sector.

Featured projects:

- **MarramWind (Scotland):** ScottishPower submitted offshore consent application on 22 January for the 3 GW floating project in ScotWind zone NE6, located approximately 75 km northeast of Aberdeen. The project will use semi-submersible floating platforms with 15-20 MW turbines and dynamic export cables to shore.

- **Ulsan (South Korea):** 1.5 GW floating wind cluster off South Korea's southeastern coast, leveraging local shipyard expertise for floating platform fabrication. First phase (350 MW) targeted for 2027-2028 commissioning.

- **Utsira Nord (Norway):** 1.5 GW floating wind zone in Norwegian North Sea with competitive allocation process concluding in 2026. Project will supply renewable electricity to offshore oil and gas platforms and onshore industrial users.

- **Floating projects (Spain/Portugal):** Multiple gigawatt-scale floating wind zones off Galicia, Catalonia and Portuguese Atlantic coast advancing through maritime spatial planning and environmental assessment.

The projects share common challenges: high capital costs (30-50% premium versus fixed-bottom offshore wind), limited specialized installation vessel availability, dynamic cable supply constraints, and complex mooring systems requiring extensive seabed surveys and installation expertise.

However, they also offer critical advantages for deeper water sites: ability to access higher quality wind resources in 60-300 meter water depths where fixed-bottom foundations are technically or economically unviable, potential for port-side full turbine integration reducing offshore installation complexity, and future potential for redeployment or relocation if wind farm repowering or site optimization is required.

4.2 Floating Wind Cost Reduction Pathways

DNV analysis released during the week emphasized that floating offshore wind must achieve significant cost reductions over the next five years to reach commercial competitiveness with fixed-bottom technology. Key cost reduction levers identified include:

- **Industrialization of floating platform production:** Transition from one-off fabrication to serial production using shipyard construction methods, standardized designs and automated welding and assembly processes.

- **Supply chain scaling:** Development of dedicated floating wind manufacturing facilities, specialized installation vessels and port infrastructure capable of handling large floating platforms.

- **Digital optimization:** Real-time structural health monitoring, predictive maintenance algorithms and digital twin optimization enabling higher availability and lower operating costs.

- **Dynamic cable innovation:** Improved design, testing and installation techniques addressing fatigue, motion tolerance and long-term reliability – the critical interface between floating turbine and seabed grid connection.

Industry consensus suggests that floating wind must target levelized cost of energy (LCOE) below €60/MWh by 2030 to compete with fixed-bottom offshore wind in suitable locations and below €50/MWh by 2035 to enable large-scale commercial deployment.

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5. MARINE ENERGY: POLICY DEVELOPMENTS AND SECTOR PROGRESS

5.1 UK Allocates 20 MW to Tidal Stream in AR7a Auction

The UK government awarded Contracts for Difference (CfDs) to four tidal stream projects totaling 20 MW in the Allocation Round 7a (AR7a) renewable energy auction, results of which were publicized during the week ending 13 February[17]. The projects cleared at £265/MWh (2024 prices), reflecting the early-stage commercialization status of tidal stream technology and higher costs compared to mature offshore wind (£65/MWh) and solar PV (£65/MWh).

Successful projects:

- **Largest project (10 MW):** Wales-based tidal stream installation

- **Mor Energy GO3 Phase 2 (5.5 MW):** Wales tidal project

- **Morlais (3 MW):** Wales tidal development

- **Fourth project (1.5 MW):** Additional Welsh tidal installation[17]

The concentration of successful projects in Wales reflects the region's exceptional tidal resources, particularly in the Celtic Sea and Irish Sea approaches, combined with supportive local planning frameworks and established marine energy test facilities.

While tidal stream capacity remains small compared to offshore wind (UK operational offshore wind capacity exceeds 15 GW), the technology offers unique value proposition: highly predictable generation profile enabling accurate forecasting years in advance, potential for baseload-like operation in high-resource locations with multiple tidal cycles per day, and minimal visual impact due to fully submerged turbines.

For supply chain companies, tidal stream presents niche opportunities in specialized subsea equipment, underwater cable installation, marine operations in high-current environments and remote condition monitoring systems. The technology's maturation could open export markets in regions with strong tidal resources including Canada (Bay of Fundy), France (Brittany coast), Japan and Southeast Asia.

5.2 Canada Releases National Marine Renewables Roadmap

Marine Renewables Canada (MRC) released its "Marine Renewable Energy Sector Vision 2050" on 9 February 2026, establishing the first national roadmap for offshore wind, tidal, wave and river current energy in Canada. The document sets an ambitious target of more than 1 GW of tidal energy capacity by 2050, supported by large-scale commercial projects and smaller community-scale installations on Atlantic and Pacific coasts.

Key strategic elements:

- **Demand context:** Canada's electricity demand projected to more than double by 2050 driven by transport and heating electrification, industrial electrification, data center growth and clean fuel production (hydrogen, synthetic fuels).

- **Tidal energy role:** Predictable generation delivering power during evening demand peaks and periods when solar and wind output is low, providing system flexibility and reducing fossil fuel reliance in coastal and remote communities.

- **Regional activity:** Detailed tidal energy developments in British Columbia (Pacific coast) and Nova Scotia (Bay of Fundy), including renewed federalprovincial regulatory cooperation and Indigenous-led community initiatives displacing diesel generation.

- **Policy enablers:** Fourteen recommended actions including federal leadership on interprovincial transmission planning, realistic long-term procurement targets, meaningful Indigenous partnership frameworks and streamlined regulatory processes.

The Canadian roadmap represents growing international recognition that marine energy – particularly tidal stream – is transitioning from research phase toward commercial viability in specific high-resource markets. For UK marine energy technology developers with proven systems and operational experience, Canada offers significant export opportunity leveraging North Sea and Celtic Sea track records.

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6. MIDDLE EAST RENEWABLE ENERGY ACCELERATION

6.1 MENA Region Solar and Storage Deployment Surge

The Middle East and North Africa (MENA) region achieved 43.7 GW of operational renewable energy capacity by end-2025, representing 44% year-on-year growth, with solar PV accounting for 34.5 GW (approximately 79% of installed renewables).

The region's renewable project pipeline has reached approximately 202 GW – nearly matching aggregated national targets through 2030, including 38 GW currently under construction.

Country highlights:

- **Saudi Arabia:** Operational renewable capacity nearly tripled in 2025 to reach 11.7 GW. Advancing large-scale solar projects including Al Shuaibah (~2.6 GW), Ar Rass 2 (~2 GW) and Al Kahfah (~1.425 GW). The $8.4 billion NEOM green hydrogen facility continues construction using renewable power for hydrogen production targeting export markets.

- **UAE:** Masdar and Emirates Water and Electricity Company commenced construction on 5.2 GW solar park integrated with 19 GWh battery energy storage – among world's largest renewable-plus-storage complexes. Project designed to deliver baseload clean power reducing gas-fired generation reliance. Masdar portfolio capacity reached 65 GW with company targeting 100 GW by 2030.

- **Oman:** Progressing multiple green hydrogen consortia in Duqm and Salalah targeting export markets. Manah 1 solar project (500 MW) commenced commercial operations in Q1 2025.

Technology cost trends:

Recent competitive auction prices have pushed solar levelized costs below $0.015/kWh in Saudi Arabia and UAE – among the world's lowest. These economics enable project financing at scale without government subsidies and are driving private sector investment momentum.

The region's renewable energy expansion creates opportunity for North East Scotland supply chain companies in specialized domains: metocean and geotechnical surveys for emerging offshore wind sites (particularly Saudi offshore wind feasibility studies), marine logistics and port development for component handling, electrolyzer manufacturing and installation for green hydrogen facilities, and pipeline infrastructure for hydrogen export terminals supporting ammonia synthesis and liquefaction plants.

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7. POLICY, REGULATION AND INVESTMENT SIGNALS

7.1 UK AR7a Auction Delivers 6.2 GW Clean Energy Capacity

The UK government awarded Contracts for Difference (CfDs) to 6.2 GW of renewable energy projects in Allocation Round 7a (AR7a), results announced during the week ending 13 Feb. The auction delivered significant capacity across multiple technologies:

- **Solar PV:** 4.9 GW awarded at clearing price of £65.23/MWh (2024 prices) – the largest single-technology allocation.

- **Onshore wind:** Substantial capacity secured supporting continued UK onshore wind development.

- **Tidal stream:** 20 MW awarded at £265/MWh reflecting early-stage technology status.

The AR7a results demonstrate continued strong developer appetite for UK renewable energy investment despite challenges including grid connection delays, supply chain pressures and planning constraints. The solar PV allocation is particularly significant, representing rapid deployment potential given shorter construction timelines compared to offshore wind.

For supply chain companies, the 6.2 GW of contracted capacity creates sustained demand for solar modules and mounting systems, onshore wind turbines and balance-of-plant equipment, grid connection infrastructure and construction and installation services through 2026-2028.

7.2 European Union Sustainable Energy Week 2026 Preview

The European Commission announced that the 20th edition of European Sustainable Energy Week (EUSEW) will take place 9-11 June 2026 in Brussels and online, under the theme "A clean, secure and competitive Energy Union". The event – Europe's largest annual gathering focused on renewables and efficient energy use – will emphasize building secure and resilient energy systems while providing clean, affordable energy.

The EUSEW 2026 theme reflects European policy priorities following recent energy security challenges and the ongoing imperative to reduce fossil fuel dependence while maintaining industrial competitiveness. Sessions will address offshore wind integration, hydrogen infrastructure deployment, CCUS scale-up, grid modernization and financing mechanisms for energy transition projects.

For North East Scotland companies, EUSEW provides critical networking opportunity with European policymakers, utilities, transmission system operators, developers and fellow supply chain companies. The event offers visibility into upcoming policy developments, funding programs and tender opportunities across EU member states.

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8. SKILLS, WORKFORCE AND SUPPLY CHAIN DEVELOPMENT

8.1 Offshore Wind and Hydrogen Workforce Scaling Challenges

Industry commentary during the week highlighted persistent challenges in recruiting and retaining skilled workers across offshore wind, hydrogen infrastructure and CCUS sectors. Despite significant policy support and project pipelines, workforce availability in critical disciplines remains constrained.

Pinch-point skills identified:

- **Marine coordination:** Project managers with deep understanding of offshore operations, vessel logistics, weather window planning and multi-contractor coordination.
- **HV electricians:** High-voltage electrical specialists for offshore substation construction, commissioning and maintenance.

- **Subsea specialists:** Engineers and technicians with expertise in cable installation, subsea equipment deployment and underwater inspection and repair.
- **Hydrogen engineers:** Specialists in high-pressure gas systems, electrolyzer operation and maintenance, pipeline integrity and hydrogen safety protocols.
- **Welding and fabrication:** Coded welders for offshore structures, pipeline construction and complex subsea components.

Regional training infrastructure is expanding but faces challenges keeping pace with industry demand growth. Scotland's Energy Transition Zone (ETZ) Skills Campus and North East Scotland College offshore wind programs are increasing capacity, but lead times for developing fully qualified offshore technicians (typically 2-3 years including apprenticeships and offshore survival training) create inherent workforce supply lags.

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9. WEEK IN FOCUS: TURBINE TECHNOLOGY RACE – THE PURSUIT OF 20 MW AND BEYOND

The successful grid connection of China's first 20 MW offshore wind turbine on 6 February 2026 marks a watershed moment in the global turbine technology race and raises important strategic questions for European and North American offshore wind sectors.

Why turbine capacity matters:

Larger turbines deliver fundamental project economics improvements through several mechanisms:

1. **Fewer installations:** A 1 GW offshore wind farm requires 67 turbines at 15 MW capacity or 50 turbines at 20 MW capacity – reducing foundation, cable and installation vessel costs by approximately 25%.
2. **Lower O&M costs:** Fewer turbines mean fewer annual service visits, reduced spare parts inventory and lower long-term maintenance vessel requirements.
3. **Better resource capture:** Larger rotor diameters and higher hub heights access stronger, more consistent winds at increased elevations.
4. **Simplified grid integration:** Fewer turbine grid connection points reduce electrical complexity and substation requirements.

However, larger turbines introduce technical challenges:

- **Installation vessel capacity:** Very few installation vessels globally can lift nacelles and components exceeding 1,500 tonnes at heights over 150 meters. The 20 MW turbine category will require next-generation jack-up vessels with significantly higher crane capacity.

- **Port infrastructure:** Larger blades (exceeding 120 meters length) require expanded quayside lay-down areas and specialized handling equipment.

- **Grid connection:** Higher per-turbine capacity requires more robust inter-array cables and export systems with greater fault tolerance.

- **Reliability unknowns:** Larger turbines incorporate unproven components and systems with limited operational track record, creating potential availability risks.

Strategic divergence:

China's aggressive pursuit of 20 MW+ platforms reflects strategic priorities including technology leadership, domestic manufacturing capacity utilization and rapid offshore wind deployment to meet renewable energy targets. The country's state-owned utilities and developers can absorb higher technology risk in pursuit of longer-term cost reductions and capabilities.

European and North American markets, by contrast, emphasize proven reliability and bankability. Developers and financiers prioritize turbines with established operational track records, predictable maintenance requirements and strong original equipment manufacturer (OEM) warranties. This conservative approach reflects different risk tolerances in markets where project finance depends on private capital rather than state backing.

Implications for North East Scotland:

The turbine technology race creates both opportunity and challenge for regional supply chain companies:

Opportunities:

- Growing demand for heavy-lift installation vessels, specialized port facilities and large-component handling equipment

- Potential for Scottish ports (Aberdeen, Dundee, Nigg) to position as heavy-lift hubs for next-generation turbine installation campaigns

- Offshore construction expertise developed in North Sea oil and gas directly applicable to ultra-large turbine installation and commissioning
- Digital twin development, predictive maintenance and remote operations capabilities increasingly valuable as turbine complexity rises

Challenges:

- Chinese turbine OEMs (Goldwind, Mingyang, Envision) gaining cost and technology advantages that may enable aggressive pricing in international markets
- Risk that European turbine manufacturers (Vestas, Siemens Gamesa) lose technology leadership if they cannot match Chinese capacity scaling
- Potential for Asian turbine OEMs to vertically integrate supply chains, reducing opportunities for European component suppliers

The next 18-24 months will be critical: if Chinese 20 MW turbines demonstrate strong reliability and availability in real-world offshore conditions, European and North American markets may accelerate adoption despite conservative risk preferences. Conversely, if early operational experience reveals significant technical challenges, the European/North American approach of optimizing 15-18 MW platforms will be validated.

For supply chain companies, the prudent strategy is capability development across multiple turbine capacity ranges rather than betting exclusively on ultra-large platforms – maintaining flexibility to serve both technology pathways as the market evolves.

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